

**AMENDMENT OF CLAIMS**

1. (previously presented) A method for imaging a three-dimensional data volume, said three-dimensional data volume comprising a plurality of voxels, each voxel comprising a three-dimensional location and a dataword, said dataword being representative of a physical phenomena, said method comprising;

creating at least one three-dimensional sampling probe, wherein said three-dimensional sampling probe is the same size or a subset of said three-dimensional data volume, said three-dimensional sampling probe having a probe face in a probe face plane and an opposing probe face in an opposing probe face plane;

producing a plurality of control points in said probe face plane, said plurality of control points defining one or more lines on said probe face plane;

extending a ribbon section from said probe face plane toward said opposing probe face plane, one edge of said ribbon section being formed by said one or more lines; and

selectively imaging datawords representative of said physical phenomena only at three-dimensional locations which intersect said ribbon section and said three-dimensional sampling probe.

2. (original) The method of Claim 1, further comprising:  
  
editing said plurality of control points in said probe face plane to thereby  
  
redefine said one or more lines, and  
  
extending another redefined ribbon section from said probe face plane  
  
toward said opposing probe face plane.
3. (original) The method of Claim 2, wherein said step of editing further  
comprises: deleting one or more of said plurality of control points.
4. (original) The method of Claim 2, wherein said step of editing further  
comprises: changing a location of one or more of said plurality of control points.
5. (original) The method of Claim 2, wherein said step of editing further  
comprises: adding one or more control points to said plurality of control points.
6. (original) The method of Claim 1, wherein said ribbon section is  
perpendicular to said probe face plane.
7. (original) The method of Claim 1, wherein said ribbon section  
extends from said probe face plane to said opposing probe face plane.
8. (original) The method of Claim 1, wherein said one or more lines  
comprise a plurality of straight lines.
9. (original) The method of Claim 1, wherein said one or more lines  
form a closed line.

10. (original) The method of Claim 1, wherein said ribbon section is comprised of a plurality of planes.

11. (original) The method of Claim 1, wherein said three-dimensional probe has a plurality of side faces perpendicular to said probe face plane, said ribbon section being unparallel with respect to each of said plurality of side faces.

12. (previously presented) A program storage device readable by a machine, embodying a program of instructions executable by machine to perform method steps for imaging a three-dimensional data volume, said three-dimensional data volume comprising a plurality of voxels, each voxel comprising a three-dimensional location and a dataword, said dataword being representative of a physical phenomena, said method comprising:

displaying a plane within said three-dimensional data volume;

producing a plurality of control points in said plane, said plurality of control points defining one or more lines on said plane;

extending a ribbon section from said plane, one edge of said ribbon section being formed by said one or more lines; and

selectively imaging said datawords representative of said physical phenomena only at three-dimensional locations which intersect said ribbon section and said three-dimensional data volume.

13. (original) The method of Claim 12, further comprising:  
  
editing said plurality of control points in said plane to thereby redefine  
  
said one or more lines, and  
  
extending another redefined ribbon section from said plane toward an  
  
opposing plane.
14. (original) The method of Claim 13, wherein said step of editing  
further comprises: deleting one or more of said plurality of control points.
15. (original) The method of Claim 13, wherein said step of editing  
further comprises: changing a location of one or more of said plurality of control points.
16. (original) The method of Claim 13, wherein said step of editing  
further comprises: adding one or more control points to said plurality of control points.
17. (original) The method of Claim 12, wherein said ribbon section is  
perpendicular to said plane.
18. (original) The method of Claim 12, wherein said ribbon section  
extends from said plane to an opposing plane.
19. (original) The method of Claim 12, wherein said one or more lines  
comprise a plurality of straight lines.
20. (original) The method of Claim 12, wherein said one or more lines  
form a closed line.

21. (original) The method of Claim 12, wherein said ribbon section is comprised of a plurality of planes.

22. (original) The method of Claim 12, wherein said plane is a probe face plane of a three-dimensional probe which has a plurality of side faces perpendicular to said probe face plane, said ribbon section being oriented so as not to be parallel to at least one of said plurality of side faces.

23. (original) A method for imaging a three-dimensional data volume, said three-dimensional data volume comprising a plurality of voxels, each voxel comprising a three-dimensional location and a dataword, said method comprising:

positioning a face of a probe at a first position within said three-dimensional data volume;

forming a first set of control points on said face of said probe for tracking a physical phenomena described by said three-dimensional data volume, said first set of control points defining a first spline curve;

moving said face of said probe to a second position within said three-dimensional volume;

forming a second set of control points on said face of said probe for tracking said physical phenomena, said second set of control points defining a second spline curve; and

interpolating between said first spline curve and said second spline curve  
to define a three-dimensional surface representative of said  
physical phenomena.

24. (original) The method of Claim 23, further comprising: displaying  
the surface representative of said physical phenomena, said surface intersecting said first  
set of control points and said second set of control points.

25. (original) The method of Claim 23, further comprising:  
  
interpolating between said first set of control points to define said first  
spline curve and interpolating between said second set of control  
points to define said second spline curve, at least one of said first  
spline curve and said second spline curve being curvilinear.

26. (original) The method of Claim 23, further comprising:  
  
moving said face of said probe to a third position within said three-  
dimensional volume;

forming a third set of control points on said face of said probe for tracking  
said physical phenomena, said third set of control points defining a  
third spline curve; and

interpolating between said first spline curve, said second spline curve, and  
said third spline curve for enlarging said surface.

27. (original) The method of Claim 23, further comprising:  
  
editing at least one of said first set of control points and said second set of control points.
28. (original) The method of Claim 23, further comprising:  
  
forming a plurality of v-curves which interconnect between respective control points at said first position of said probe and said second position of said probe.
29. (original) The method of Claim 28, further comprising:  
  
displaying said spline curves and said v-curves, said spline curves and said v-curves forming a grid representative of said physical phenomena, said grid having a plurality of intersections between said spline curves and said v-curves.
30. (original) The method of Claim 29, further comprising:  
  
selecting one of said plurality of intersections, and moving said intersection to thereby edit said grid.
31. (original) The method of Claim 29, further comprising:  
  
selecting one of said plurality of intersections to thereby reposition said face to pass through said intersection.

32. (original) The method of Claim 29, further comprising:

selecting one of said first set of control points and said second set of control points to thereby reposition said face to pass through one of said first set of control points and said second set of control points.

33. (original) The method of Claim 23, further comprising:

forming a third set of control points on said face of said probe at said first position, said third set of control points defining a third spline curve;

forming a fourth set of control points on said face of said probe at said second position, said fourth set of control points defining a fourth spline curve; and

interpolating between said third spline curve and said fourth spline curve to define another three-dimensional surface representative of another physical phenomena described by said three-dimensional data volume, said three-dimensional surface and said another three-dimensional surface being defined substantially at the same time.

34. (original) A program storage device readable by a machine, embodying a program of instructions executable by machine to perform method steps for imaging a three-dimensional data volume, said three-dimensional data volume



comprising a plurality of voxels, each voxel comprising a three-dimensional location and a dataword, said method comprising:

positioning a plane at a plurality of plane positions within said three-dimensional data volume;

forming a set of control points at each of said plurality of plane positions such that each of said set of control points defines a related spline curve; and

interpolating between each of said spline curves to form a surface representative of a physical phenomena described by said three-dimensional data volume.

35. (original) The method of Claim 34, further comprising:

displaying said surface representative of said physical phenomena, said surface intersecting each of said set of control points.

36. (original) The method of Claim 34, further comprising:

interpolating between each of said set of control points to define said related spline curves, at least one of said related spline curves being curvilinear.

37. (original) The method of Claim 34, further comprising:

editing one or more of said control points.

38. (original) The method of Claim 34, further comprising:  
  
forming a plurality of v-curves which interconnect between respective  
control points at said plurality of plane positions.
39. (original) The method of Claim 38, further comprising:  
  
displaying said spline curves and said v-curves to form a grid  
representative of said physical phenomena, said grid having a  
plurality of intersections between said spline curves and said v-  
curves.
40. (original) The method of Claim 39, further comprising:  
  
selecting one of said plurality of intersections, and moving said  
intersection to thereby edit said grid.
41. (original) The method of Claim 39, further comprising:  
  
selecting one of said plurality of intersections to thereby reposition said  
plane to pass through said intersection.
42. (original) The method of Claim 39, further comprising:  
  
selecting one of said sets of control points to thereby reposition said plane  
to pass through said one of said sets of control points.

43. (original) The method of Claim 34, further comprising:

forming another set of control points at each of said plurality of plane positions, such that each of said another set of control points defines another related spline curve; and

interpolating between each of said another spline curves to form another surface representative of another physical phenomena described by said three-dimensional data volume, said surface and said another surface being formed substantially at the same time.

44. (new) A method for imaging a three-dimensional data volume, said three-dimensional data volume comprising a plurality of voxels, each voxel comprising a three-dimensional location and a dataword, said method comprising:

positioning a face of a probe at a first position within said three-dimensional data volume;

forming a first set of control points on said face of said probe for tracking a physical phenomena described by said three-dimensional data volume, said first set of control points defining a first spline curve;

moving said face and said probe to a second position within said three-dimensional volume;

forming a second set of control points on said face of said probe for tracking said physical phenomena, said second set of control points defining a second spline curve;

interpolating between said first spline curve and said second spline curve  
to define a three-dimensional surface representative of said  
physical phenomena; and

forming a plurality of v-curves which interconnect between respective  
control points at said first position of said probe and said second  
position of said probe.

45. (new) The method of Claim 44, further comprising:

displaying said spline curves and said v-curves, said spline curves and said  
v-curves forming a grid representative of said physical phenomena,  
said grid having a plurality of intersections between said spline  
curves and said v-curves.

46. (new) The method of Claim 45, further comprising:

selecting one of said plurality of said intersections, and moving said  
intersection to thereby edit said grid.

47. (new) The method of Claim 45, further comprising:

selecting one of said plurality of intersections to thereby reposition said  
face to pass through said intersection.

48. (new) The method of Claim 45, further comprising:

selecting one of said first set of control points and said second set of control points to thereby reposition said face to pass through one of said first set of control points and said second set of control points.

49. (new) A program storage device readable by a machine, embodying a program of instructions executable by machine to perform method steps for imaging a three-dimensional data volume, said three-dimensional data volume comprising a plurality of voxels, each voxel comprising a three-dimensional location and a dataword, said method comprising:

positioning a plane at a plurality of plane positions within said three-dimensional data volume;

forming a set of control points at each of said plurality of plane positions such that each of said set of control points defines a related spline curve; and

interpolating between each of said spline curves to form a surface representative of a physical phenomena described by said three-dimensional data volume; and

forming a plurality of v-curves which interconnect between respective control points at said plurality of plane positions.

50. (new) The method of Claim 49, further comprising:

displaying said spline curves and said v-curves to form a grid representative of said physical phenomena, said grid having a plurality of intersections between said spline curves and said v-curves.

51. (new) The method of Claim 50, further comprising:

selecting one of said plurality of intersections, and moving said intersection to thereby edit said grid.

52. (new) The method of Claim 50, further comprising:

selecting one of said plurality of intersections to thereby reposition said plane to pass through said intersection.

53. (new) The method of Claim 50, further comprising:

selecting one of said sets of control points to thereby reposition said plane to pass through said one of said sets of control points.